



VIA EFS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Patent Application of:	:	
Henrich Cheng	:	
Conf. No.:	2231	: Group Art Unit: 3734
Appln. No.:	10/766,530	: Examiner: Michael G. Mendoza
Filing Date:	January 29, 2004	: Attorney Docket No.: 681942-1US (HC0001US)

Title: METHOD AND MIXTURE FOR NERVE ROOT REPAIR

DECLARATION OF HENRICH CHENG UNDER 37 C.F.R. § 1.132

I, Henrich Cheng, hereby declare as follows:

1. I am the inventor of the invention described and claimed in patent application No. 10/766,530 (hereinafter '530 App). I am employed as Chief of Center for Neural Regeneration at Taipei Veterans General Hospital, Taiwan, R.O.C., and a professor in the Department & Institute of Pharmacology, School of Medicine, National Yang-Ming University at Taiwan, R.O.C. My current research focuses on repair of spinal cord and nerve roots after trauma and neural regeneration and trophic factor. Please refer to my C.V. as shown in Schedule A, which shows my education, experience, awards, and relevant publications and patents. Based on the foregoing, I believe that I qualify as an expert and am considered by others to be an expert in the field and science mentioned above.

2. I am familiar with the '530 App, and have reviewed the Office Action mailed on July 21, 2008 on the '530 App. The '530 App is based on a new method of functionally connecting a portion of the peripheral nervous system to a portion of the central or peripheral nervous system of a vertebrate by applying to the gap with a fibrin glue mixture, comprising a growth factor, fibrinogen, aprotinin and divalent calcium ions, which is supported by such as Example 1 and Example 4 of the '530 App.

3. As shown in Example 1 of the '530 App (on page 10), rats having paralysis of the hand muscles, which were repaired by the method of the present invention, showed signs of recovery two or three weeks later. Two months postoperatively, the group's ability to freely move the left elbow progressed, as well as their ability to fully extend claws while reaching and their ability to bear weight.

4. As showed in Example 4 of the '530 App (on page 13), the rats had a transected 15 mm nerve removed, and fibrin glue mixtures containing and not containing 1 $\mu\text{g}/\mu\text{l}$ aFGF were applied to the gap. Eight weeks postoperatively, the lesion degree was evaluated by the Sciatic Function Index (SFI), and the rats receiving the repair method of the present invention (fibrin glue mixtures containing 1 $\mu\text{g}/\mu\text{l}$ aFGF) had higher scores, which means a better recovery. Altogether, the invention is based on the discovery that avulsions between the central and peripheral nervous systems can be repaired using a fibrin glue mixture containging 1 $\mu\text{g}/\mu\text{l}$ aFGF as claimed to restore the functional connection of the avulsed ends.

5. Based on my knowledge and being the primary inventor of Cheng et al. (US 6235041), I am sure that the present invention is quite different from Cheng et al. for the following reasons. In Cheng et al. (US 6235041), the invention as claimed deals with the repair of different nerve regions. Cheng et al. provides a medical device of a biocompatible material for use in the treatment for a gap or defect in the central nervous system and adapted to enable connection of nerve fibers of gray and white matter between the proximal end and distal end thereof in predetermined openings (see Abstract). However, the present invention provides a method of functionally connecting a portion of the peripheral nervous system and a portion of the central or peripheral nervous system. Please refer to the diagram (Fig.1) below for demonstration.

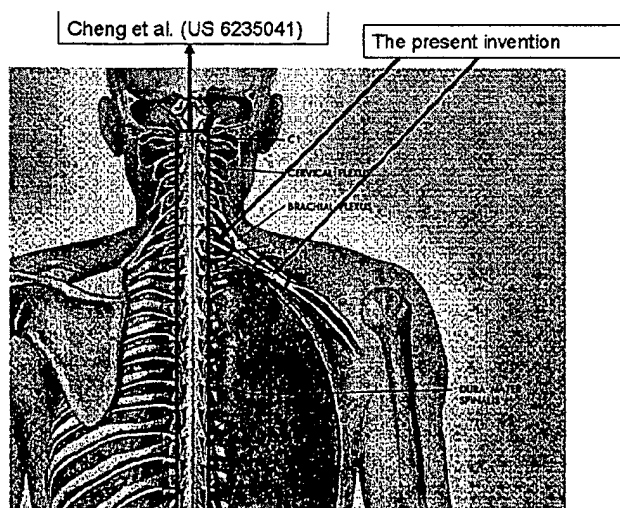


Fig.1

The rectangle is the spinal cord, where the medical device of Cheng et al. was applied, and the two circles represent the positions (the junction of spinal nerves and peripheral nerves or peripheral nerves themselves) where the present invention is applied. The invention disclosed in Cheng et al. is different from the invention claimed in the '530 App, because of the repair of different regions of nerves.

6. It is well known that the central nerve system is made up of the spinal cord and brain. Both the spinal cord and brain contain "white matter" and "gray matter," wherein white matter is bundles of axons coated with a sheath of myelin, and gray matter is masses of cell bodies and dendrites. Each pair of spinal cord nerves is "mixed" nerves, containing sensory and motor axons. However, peripheral nerves are not "mixed" nerves, and neither sensory nor motor nerves contain "white matter" and "gray matter." Cheng et al. only dealt with the connection of a break of the spinal cord. More particularly, Cheng et al. provides a device and method for connecting the "gray matter" and "white matter" in the spinal cord. The '530 App provides a method for connecting the spinal cord and a peripheral nerve (i.e., nerve root) or for repairing the gap or defect in the peripheral nerve with the fibrin glue mixtures containing aFGF, and it has nothing to do with white matter and gray matter. Because of the different structure and function between the spinal cord or the central nerves on the one hand, and the peripheral nerves on the other hand, there is no way to expect either the medical device or the fibrin glue composition as claimed in Cheng et al. to work on peripheral nerve system. Careful and meaningful experimentation was necessary to invent the subject matter claimed in the '530 App. Given the above, the present invention was not and would not have been obvious over Cheng et al.

7. Schenck et al. (US 4553542, "Schneck") is related to an encircling device by which anatomical structures, such as the outer nerve sheaths, are being anastomosed. But throughout the specification of Schenck, there is neither a description of the definition of "nerves" nor examples showing the success in the recovery in function after the suture for the anastomoses. As mentioned above, "nerves" in different regions have different functions and structures. Schenck neither taught nor suggested the connection between the spinal cord and a peripheral nerve (i.e., nerve root) or a break of a peripheral nerve with the fibrin glue mixtures containing aFGF. Moreover, there is no functional recovery data among the embodiments of Schenck. Even though the nerve sheaths were anastomosed by the device of Schenck, there was still no evidence to show that the nervous repair was successful in functional recovery. Therefore, the present invention would not have been obvious over Cheng et al. in view of Schenck.

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5. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the above-identified application or any patent issued thereon.

Date: 2/28/22 By: Henrich Cheng
Henrich Cheng

Schedule A

Curriculum Vitae

Henrich Cheng M.D., Ph.D.

Chief, Center for Neural Regeneration, Taipei Veterans General Hospital
Professor, Dept. & Inst. Pharmacology, School of Medicine, National Yang-Ming University
Chairman, Taiwan Neurospinal Society

Education:

1993-1996 **Karolinska Institute. Ph.D. in Neuroscience**
 Stockholm, Sweden
1975-1983 **National Yang-Ming University. Doctorate degree in Medicine**
 Taipei, Taiwan

Professional Experience:

2007 **Professor of Brain Research Center**
 Department of Medicine, National Yang-Ming University
 Taipei, Taiwan
2006 **Professor of Pharmacology**
 Department of Medicine, National Yang-Ming University
 Taipei, Taiwan
2005 **Visiting Professor**
 Department of Neurological Surgery, University of California, Davis
 California, USA
2002-2006 **Chief of the Neural Regeneration Center**
1997-2003 **Neural Regeneration Laboratory Chief of Staff**
 Neurological Institute, Taipei Veterans General Hospital
 Taipei, Taiwan
 Associate Professor of Surgery
 Department of Medicine, National Yang Ming University
 Taipei, Taiwan
 Visiting Associate Professor
 Department of Neuroscience, Karolinska Institute
 Stockholm, Sweden
1998-2002 **Visiting Professor**
 Barrow Neurological Institute
 Phoenix, Arizona, USA.
1990-2001 **Attending Physician**
 Department of Neurosurgery, Taipei Veterans General Hospital
 Taipei, Taiwan
1990-1997 **Lecturer**
 Surgery Section, Department of Medicine
 National Yang Ming University
 Taipei, Taiwan
1985-1990 **Teaching Assistant**
 Surgery Section, Department of Medicine
 National Yang-Ming University, Taipei Veterans General Hospital
 Taipei, Taiwan

Awards:

- 2008 **Outstanding Professor**
Elected by students on campus
National Yang-Ming University
- 2007 **Outstanding Medical Contribution**
National Yang-Ming University
- 2007 **Leading Innovation on Medical Technique and Treatment**
Taipei Veterans General Hospital, Taiwan, ROC
- 2006 **Leading Health Professionals of the World**
International Biographical Center, Cambridge, England
- 2004 **First Outstanding Alumnus**
National Yang-Ming University Award
- 2003 **Outstanding Physician**
Veterans Affairs Commission, Executive Yuan, ROC
- 2003 **Outstanding Research & Development**
Strategies for Neural Regeneration: Growth Factor Cocktail Therapy, Olfactory Ensheathing Cell, and Neuroprotective Gene Therapy
Veterans Affairs Commission, Executive Yuan, ROC
- 2003 **Certificate of Achievement Award**
10th Sino-Japan Symposium on Cancer Treatment, Taiwan
- 2001 **Christopher Reeve Paralysis Foundation**
Research Grants Program Award
- 2001 **Nominated for Best Hospital Structure Recommendation: Spinal Cord Injury Repair Strategy**
The Executive Yuan of the Republic of China
- 1999 **Erenst Bors Society Research Award**
California, USA
- 1997-1998 **Medical Innovation Award**
Taipei Veterans General Hospital
- 1997-1998 **Amzhong Who's Who Award**
Outstanding Academic Achievement, USA
- 1997 **Le Lauréat**
Neurology & Psy Association of France

Major Research Interests:

1. Repair of spinal cord and nerve roots after trauma
2. Neural regeneration and trophic factor

Publications:

1. Cheng H*, Shoung HM, and Lee LS. Surgical treatment of cervical spine tuberculosis. **J of Surg Asso, ROC** 1990; 23, 169-174.
2. Cheng H*, Huang CI, Huang SR, and Lee LS. Quadriplegia and atlanto-axial dislocation caused by atlanto-axial tuberculosis. **J of Surg Asso, ROC** 1990; 23, 344-348.
3. Shoung HM, Cheng H*, Lee LS, Wu ZA, and Ho DMT. Animal study on intercostals neurotization in avulsion brachial plexus injury. **J of Surg Asso, ROC** 1990; 22-2: 114-119.
4. Cheng H*, Wang LS, Pan HC, Shoung HM, and Lee LS. Diaphragm pacing for the ventilatory support of the quadriplegic patients with respiratory paralysis. **Chinese Medical J (Taipei)** 1992; 49: 116-22.
5. Cheng H*, Almstrom S, and Olson L. Fibrin glue used as an adhesion agent in

- CNS tissues. **J of Neural Transplantation & Plasticity** 1995; 5(4): 233-243.
6. Cheng H*, Hoffer B, Stromberg I, Russell D, Olson L. The effect of glial cell line-derived neurotrophic factor in fibrin glue on developing dopamine neurons. **Exp Brain Res**. 1995; 104: 199-206.
 7. Cheng H* and Olson L. A new surgical technique that improves proximo-distal regeneration of 5-HT fibers after complete transection of the rat spinal cord. **Experimental Neurology**. 1995; 136: 149-161.
 8. Cheng H*, Cao Y, Olson L. Spinal cord repair in adult paraplegic rats: partial restoration of hind limb function. **Science** 1996; 273, 510-513.
 9. Cheng H*, Shoung HM, Chen KC, Wu ZA, Lee LS. Functional connectivity of the transected brachial plexus after intercostal neurotization in monkeys. **J Comp Neurol**. 1997; 380: 155-163.
 10. Olson L and Cheng H*. Spinal Cord Repair Strategy: Problems and prospects. **J. Spinal Cord Medicine** 1997; 20: 379-382.
 11. Cheng H*, Almstrom S, Gimenez-Llort L, Cheng R, Ogren S, Hoffer B, Olson L. Gait analysis of adult paraplegic rats after spinal cord repair. **Experimental Neurology**. 1997; 148: 544-557.
 12. Cheng H*, Fraidakis M, Blomback B, Lapchak P, Hoffer B, and Olson L. Characterization of a fibrin glue-GDNF slow-release preparation. **Cell Transplant** 1998; 7: 1: 53-61.
 13. Olson L, Cheng H*, Zetterström R, Solomin L, Jansson L, Giménez-Llort L, Hoffer B, Perlmann T. On CNS repair and protection strategies: novel approaches with implications for spinal cord injury and Parkinson's disease. **Brain Research Reviews** 1998; 26: 302-305.
 14. Fraidakis M, Klason T, Cheng H*, Olson L, and Spenger C. High-Resolution MRI of Intact and Transected Rat Spinal Cord. **Experimental Neurology** 1998; 153: 299-312.
 15. Huang MC, Kubo O, Tajika Y, Cheng H*, Huang CI, Lee LS, and Takakura K. Detection of Mammosomatotrophs in Paraffin-Embedded Specimens of Various Pituitary Adenomas. **Chin Med J (Taipei)** 1999; 62:845-851.
 16. Shu CH*, Cheng H, Lirng JF, Chang FC, Chao Y, Chi KH, Yen SH. Salvage Surgery for Recurrent Nasopharyngeal Carcinoma. **Laryngoscope** 2000; 110: September.
 17. Cao Y*, Veitonmaki N, Keough K, Cheng H, Lee LS, Cao Y, and Zurakowski D. Elevated Levels of Urine Angiostatin and Plasminogen/ Plasmin in Cancer Patients. **International Journal of Molecular Medicine** 2000; 5: 547-551.
 18. Tzeng SF*, Cheng H, Lee YS, Wu JP, Hoffer B, and Kuo JS. Expression of Neural Cell Adhesion Molecule in Spinal Cords Following a Complete Transection. **Life Sciences** 2001; 68: 1005-1012.
 19. Chiu J.H., Cheng H.C., Tai C.H., Hsieh J.C., Yeh T.C., Cheng H., Lin J.G., Ho L.T. Electroacupuncture-Induced Neural Activation Detected by Use of Manganese-Enhanced Functional Magnetic Resonance Imaging in Rabbits. **AJVR** 2001; Vol 62, No. 2, February.
 20. Huang MC*, Lee LS, Ho MT, Cheng H., Chung WY, Huang CI, Hsiao CY, Pan

- HC. A Metastatic Pituitary Carcinoid Tumor Successfully Treated with Gamma Knife Radiosurgery. A Case Report. **Chinese Medical Journal (Taipei)** 2001; 64: 414-418.
21. Yang TF, Lee SS*, Lin PH, Cheng H and Chan RC. Effect of Selective Posterior Rhizotomy on Transverse Myelitis in Patient with Systemic Lupus Erythematosus: A Case Report. **Am. J. Phys. Med. Rehabil.** 2002; Vol. 81, No. 6; 467-470, June. **Selective Posterior Rhizotomy in TM.**
 22. Hsieh JC, Cheng H*, Hsieh HM, Liao_KK, Wu YT, Yeh TC, Ho LT. Loss of Interhemispheric Inhibition on the Ipsilateral Primary Sensorimotor Cortex in Patents with Brachial Plexus Injury: an fMRI Study. **Ann Neurol** 2002; 51:381-385.
 23. Chuang TY, Huang MC, Chen KC, Chang YC, Yen YS, Lee LS, and Cheng H*. Forelimb Muscle Activity Following Nerve Graft Repair of Ventral Roots in the Rat Cervical Spinal Cord. **Life Sciences.** 2002; 71, 487-496.
 24. Chuang TY*, Chiu FY, Tsai YA, Chiang SC, Yen DJ, Cheng H. The comparison of electrophysiologic findings of traumatic brachial plexopathies in a tertiary care center. **Injury, Int. J. Care Injured** 2002; 33: 591-595.
 25. Chuang TY, Huang WS, Chiang SC, Tsai YA, Doong JL, Cheng H. A virtual reality-based system for hand function analysis. **Computer Methods and Programs in Biomedicine.** 2002; 69: 189-196.
 26. Cheng H and Lee YS. Spinal Cord Repair Strategies in Spinal Cord Medicine: Principles and Practice. **Demos Medical Publishing, New York;** 2002; Chapter 59, P. 801-816.
 27. Cheng H, Wu JP, and Tzeng SF*. Neuroprotection of Glial Cell Line-Derived Neurotrophic Factor in Damaged Spinal Cords Following Contusive Injury. **Journal of Neuroscience Research** 2002; 69: 397-405.
 28. Hung SC*, Cheng H, Pan CY, Kao LS, Tsai MJ, Ma HL. In Vitro Differentiation of Size-sieved Stem Cells into Electrically Active Neural Cells. **Stem Cells** 2002; 20: 522-529.
 29. Tsai YA, Chuang TY, Yen YS, Huang MC, Lin PH and Cheng H. Electrophysiologic Findings and Muscle Strength Grading in Brachio Plexopathies: a before-after operative comparison. **Microsurgery,** 2002; 22: 11-15.
 30. Chiu JH*, Chung MS, Cheng HC, Yeh TC, Hsieh JC, Chang CY, Kuo WY, Cheng H, Ho LT. Different central manifestations in response to electroacupuncture at analgesic and onanalgesic acupoints in rats: a manganese-enhanced functional magnetic resonance imaging study. **The Canadian Journal of Veterinary Research,** 2003; 67:94-101.
 31. Ma Hsu*, Xu Ruian, Cheng H, Kuo HS, During M and Fang RH. Gene Transfer into Human Keloid Tissue with Adeno-Associated Virus Vector. **The Journal of Trauma,** 2003; 54: 569-573.
 32. Cheng H*. Introduction of the updated research in neural regeneration. **Clinical Medicine,** 2003; 51: 83-87.
 33. Huang MC*, Cheng H, Chen MS, Shih YS, Huang JY, Lee LS. Neuropathy of Tuberous sclerosis, **Clinical Medicine,** 2003; 51: 255-263.

34. Huang MC, Chen KC, Chuang TY, Chang WC, Lee LS, Huang WC and Cheng H*. Cervical Root Repair in Adult Rats after Transection: Recovery of Forelimb Motor Function. **Experimental Neurology** 2003; 180: 101-109.
35. Tai MH, Cheng H, Wu JP, Liu YL., Lin PR, Kuo JS, Tseng CJ, Tzeng SF*. Gene transfer of glial cell line-derived neurotrophic factor promotes functional recovery following spinal cord contusion. **Experimental Neurology** 2003; 183, 508-515.
36. Cheng H, Fu YS*, Kuo JW. The Ability of GDNF to Diminish Free Radical Production Leads to Protection Against Kainate-Induced Excitotoxicity in Hippocampus. **Hippocampus**, 2004; 14:77-86.
37. Ma H., Xu R., Cheng H., Kuo H.S., During M., and Fang R.H. Gene Transfer into Human Keloid Tissue with Adeno-associated Virus Vector. **Journal of Trauma**, 2003; 54, 569-573.
38. Sanford P.C. Hsu, Yang-Hsin Shih, Ming-Chao Huang, Tien-Yow Chuang, Wen-Cheng Huang, Hsiu-Mei Wu, Pei-Hsin Lin, Liang-Shong Lee, Henrich Cheng*. Repair of multiple cervical root avulsion with sural nerve graft. **Injury, Int. J. Care Injured**, 2004; 35:896-907.
39. Lee LM, Huang MC, Chuang TY, Lee LS, Cheng H., Lee IH*. Acidic FGF enhances functional regeneration of adult dorsal roots. **Life Sciences**, 2004; 74: 1937-1943.
40. Liang ML, Huang MC, Cheng H, Huang WC, Yen YS*, Shao KN, Huang CI, Lee LS. Posterior Transarticular Screw Fixation for Chronic Atlanto-Axial Instability: A Review of 22 Cases. **Journal of Clinical Neuroscience**, 2004; 11:368-372.
41. Cheng Henrich, Liao Kwong-Kum, Liao Su-Fen, Chuang Tien-Yow, Shih Yang-Hsin*. Spinal Cord Repair With Acidic Fibroblast Growth Factor as a Treatment for a Patient With Chronic Paraplegia. **Spine**, 2004; 29:14-19.
42. Tzeng Shun-Fen, Tsai May J., Hung Shih-Chieh, Cheng Henrich*. Neuronal morphological change of size-sieved stem cells induced by neurotrophic stimuli. **Neuroscience Letters**, 2004; 367:23-28.
43. Chang HA, Chuang TY, Lee SJ, Liao SF, Lee HC, Shih YH*, Cheng H., Temporal differences in relative phasing of gait initiation and first step length in patients with cervical and lumbosacral spinal cord injuries. **Spinal Cord**, 2004 May; 42(5): 281-289.
44. Lin Pei-Hsin, Chuang Tien-Yow, Liao Su-Fen, Cheng Henrich*. Cervical spinal cord injury by unusual foreign body penetration. A case report. **Injury**, 2005; 36: 22-25.
45. Cheng H, Huang SS, Lin SM, Chu YC, Chih CL, Lin HC, Huang WC, Tsai SK. The neuroprotective effect of glial cell line-derived neurotrophic factor in fibrin glue against chronic focal cerebral ischemia in conscious rats. **Brain Research**, 2005; 28-33.
46. Tsai MJ, Shyue SK, Weng CF, Chung Y, Liou DY, Huang CT, Kuo HS, Lee MJ, Chang PT, Huang MC, Huang WC, Liou KD, Cheng H*. Effect of Enhanced Prostacyclin Synthesis by Adenovirus-Mediated Transfer on Lipopolysaccharide Stimulation in Neuron-Glia Cultures. **The Annals of the**

New York Academy of Sciences, 2005; 1042: 338-348.

47. Wang CH, Chang A, Tsai MJ, Cheng H*, Liao LP, Lin AMY. Kainic acid-induced oxidative injury is attenuated by hypoxic preconditioning in rat brain. **The Annals of the New York Academy of Sciences**, 2005; 1042: 314-324.
48. M.M.H. Teng*, H. Cheng, D.M.-T Ho, C.-Y. Chang,. Intraspinal Leakage of Bone Cement after Vertebroplasty: A Report of 3 Cases. **American Journal of Radiology**, Jan 2005; 27: 224-229.
49. Lin PH, Cheng H, Huang WC, Chuang TY. Spinal cord implantation with acidic fibroblast growth factor as a treatment for root avulsion in obstetric brachial plexus palsy. **J Chin Med Assoc.** 2005 August; 68(8): 392-6.
50. Ming-Chao Huang, Yang-Hsin Shih, Min-Hsiung Chen, Wen-Yuh Chuang, Donald Ming-Tak Ho, Ren-Shyan Liu, Liang-Ming Lee, Chun-I Huang, Liang-Shong Lee, and Henrich Cheng*. Malignancy of intracerebral lesions evaluated with ¹¹C-methionine-PET. **Journal of Clinical Neuroscience**, 2005 September; 12(7): 775-780.
51. Yu-Show Fu, Yun-Chih Cheng, Maan-Yuh Anya Lin, Henrich Cheng*, Pei-Ming Chu, Shih-Chieh Chou, Yang-Hsin Shih, Miao-Hwa Ko, Min-Shan Sung. Conversion of Human Umbilical Cord Mesenchymal Stem Cells in Wharton's Jelly to Dopaminergic Neurons in Vitro-Potential Therapeutic Application for Parkinsonism. **Stem Cells**, January 2006; 24: 115 – 124; doi:10.1634/ Stem cells.2005-0053
52. P-H Lin, T-Y Chuang, K-K Liao, H Cheng, Y-S Shih. Functional Recovery of Chronic Complete Idiopathic Transverse Myelitis after Administration of Neurotrophic Factors. **Spinal Cord**, 2006 44, 254-257.
53. Wen-Cheng Huang, Wen-Chun Kuo, Juin-Hong Cherng, Pei-Rong Chen, Shih-Hui Huang, Ming-Chao Huang, Jiang-Chuan Liu, Henrich Cheng*. Chondroitinase ABC promotes axon regrowth and behavior recovery in spinal cord injury. **Biochemical and Biophysical Research Communications** 349 (2006) 963-968
54. Ming-Chao Huang, Pei-Teh Chang, May-Jywan Tsai, Huai-Sheng Kuo, Wen-Chun Kuo, Meng-Jen Lee, Ming-Jei Lo, I-Hui Lee, Wen-Cheng Huang, Liang-Ming Lee, Yang-Hsin Shih, Liang-Shong Lee, Henrich Cheng*. Sensory and Motor Recovery After Repairing Transected Cervical Roots. **Surgical Neurology** First accepted on September 20, 2006.
55. P-H Lin, T-Y Chuang, K-K Liao, H Cheng, Y-S Shih. Functional Recovery of Chronic Complete Idiopathic Transverse Myelitis after Administration of Neurotrophic Factors. **Spinal Cord**, 2006 44, 254-257.
56. Po-Yi Tsai, Tien-Yow Chuang, Henrich Cheng, Hsiu-Mei Wu, Yue-Cune Chang, and Chih-Pin Wang. Concordance and Discrepancy between Electrodagnosis and Magnetic Resonance Imaging in Cervical Root Avulsion Injury. **Journal of Neurotrauma**, Volume 23, Number 8, 2006.
57. Huai-Sheng Kuo, May J Tsai, Ming-Chao Huang, Wen-Cheng Huang, Meng-Jen Lee, Wen-Chun Kuo, Li-Hua You, Ka-Chun Szeto, I-Lun Tsai, Wen-Chi Chang, Chuan-Wen Chiu, Hsu Ma, Kin-Fu Chak, Henrich Cheng*. The Combination of Peripheral Nerve Grafts and Acidic Fibroblast Growth Factor Enhances Arginase I and Polyamine Spermine Expression in Transected Rat

- Spinal Cords. **Biochemical and Biophysical Research Communications**, 357 (2007) 1-7.
58. Ming-Chao Huang, Pei-Teh Chang, May-Jywan Tsai, Huai-Sheng Kuo, Wen-Chun Kuo, Meng-Jen Lee, Ming-Jei Lo, I-Hui Lee, Wen-Cheng Huang, Liang-Ming Lee, Yang-Hsin Shih, Liang-Shong Lee, Henrich Cheng*. Sensory and Motor Recovery After Repairing Transected Cervical Roots. **Surgical Neurology**, 68(2007) S1:17 – S1:24.
 59. Chiang-Wei Chou, Wen-Cheng Huang, Yang-Hsin Shih, Liang-Hsong Lee, Chantelle Wu, Henrich Cheng*. Occult occipital condyle fracture with torticollis and normal neurological function: case report and literature review. **Journal of Clinical Neuroscience**, First accepted on March 2, 2007; doi:10.1016/j.jocn.2007.03.014.
 60. Henrich Cheng, Yi-Cheng Huang, Pei-Teh Chang, Yi-You Huang*. Laminin-incorporated nerve conduits made by plasma treatment for repairing and spinal cord injury. **Biochemical and Biophysical Research Communications**, 357 (2007) 938-944
 61. May-Jywan Tsai, Ching-Feng Weng, Song-Kun Shyue, Dann-Ying Liou, Chien-Hung Chen, Chuan-Wen Chiu, Tsu-Hsuan Yang, Hsu-An Pan, Roanna I-Hsin Liao, Huai-Sheng Kuo, Ming-Chao Huang, Wen-Cheng Huang, Barry J. Hoffer, and Henrich Cheng*. Dual Effect of Adenovirus-Mediated Transfer of BMP7 in Mixed Neuron-Glial Cultures: Neuroprotection and Cellular Differentiation. **Journal of Neuroscience Research**, 85: 2950-2959 (2007)
 62. Yu-Show Fu*, Yen-Yang Lin, Shih-Chieh Chou, Lung-Sen Kao, Shao-Yun Hsu, Fu-Chou Cheng, Yang-Hsin Shih, Henrich Cheng, Yu-Yi Fu, Jia-Yi Tetramethylpyrazine Inhibits Activities of Glioma Cells and Glutamate Neuroexcitotoxicity – Potential Therapeutic Application for Treatment of Glioma. **Biochemical and Biophysical Research Communications**, doi: 10.1016/j.bbrc.2007.04.049
 63. Yu-Hone Hsu, Wen-Cheng Huang, Kang-Du Liou, Yang-Hsin Shih, Liang-Shong Lee, Henrich Cheng*, Cervical Spinal Stenosis and Myelopathy Due to Atlas Hypoplasia: A Case Report. **Journal of the Chinese Medical Association**, 2007; 70(8): 339 –344.
 64. Shen-Kuo Tsai, Li-Man Hung, Yuan-Tsung Fu, Henrich Cheng, Mao-Wei Nien, Hsin-Yi Liu, Friedrich Bo-Yuan Zhang and Shiang-Suo Huang*, Resveratrol neuroprotective effects during focal cerebral ischemia injury via nitric oxide mechanism in rats. **Journal of Vascular Surgery**, 2007; 46(2): 346 –353.
 65. Y.-C. Hsieh, H. Cheng, K.-H Chan, W.-K. Chang, T.-M. Liu, and C.-S. Wong*, Protective effect of intrathecal ketorolac in spinal cord ischemia in rats: a microdialysis study. **Acta Anaesthesiol Scand**, 2007; 51: 410 –414.
 66. Meng-Jen Lee, Ching Jung Chen, Chu-Hsun Cheng, Wen-Cheng Huang, Hui-Sheng Kuo, Jau-Cheng Wu, May J. Tsai, Ming-Chao Huang, Wen-Chi Chang and Henrich Cheng*, Combined Treatment Using Peripheral Nerve Graft and Acidic FGF: Changes to the Glial Environment and Differential Macrophage Reaction in a Complete Transected Spinal Cord. **Neuroscience Letters**, 433 (2008) 163–169.

67. Y.H. Chou Ms; P.L. Chao Ms.; M.J. Tsai Ph.D.; H. Cheng, MD., Ph.D.; K.B. Chen, Ph.D.; D.M. Yang, Ph.D.; C.H. Yang, MD., Ph.D.; Anya M.-Y. Lin*, Arsenite-induced cytotoxicity in dorsal root ganglion explants. **Free Radical Biology & Medicine**, 44 (2008) 1553 – 1561.
68. Jau-Ching Wu M.D.; Wen-Cheng Huang, M.D.; Yun-An Tsai, M.D.; Yu-Chin Chen, M. Sc.; and Henrich Cheng* M.D., Ph. D, Nerve repair using acidic fibroblast growth factor in human cervical spinal cord injury: a preliminary Phase I clinical study. **J Neurosurg Spine** 8: 208-214 2008.
69. Jau-Ching Wu M.D. and Henrich Cheng* M.D., Ph. D, Response to Editorial, Repair of the chronically injured human spinal cord (Michael G Fehlings, M.D., Ph.D., F.R.C.S.C.) **J Neurosurg Spine** 8: 205-207 2008.
70. Chang-Ching Yang, Yang-Hsin Shih, Miao-Hwa Ko, Shao-Yun Hsu, Henrich Cheng*, Yu-Show Fu*. Transplantation of Human Umbilical Mesenchymal Stem Cells from Wharton's Jelly after Complete Transection of the Rat Spinal Cord. **Plos One**. 2008 October; Volume 3, Issue 10, e3336.

Conference Papers:

1. Cheng H, Almstrom S, and Olson L (1994. June) Fibrin glue used as an adhesive agent in CNS tissues. *5th International symposium on Neurotransplantation*. (Paris, France)
2. Cheng H, Olson L (1994. September) Fixation of the transected rat spinal column with interspinal wiring. *17th Annual Meeting of European Neuroscience Association* (Vienna, Austria)
3. Cheng H, Almstram S, Casserlov M, Olson L (1994 November) Interspinal wiring of the transected rat spinal column. *24th Annual Meeting of Society for Neuroscience* (Miami, USA)
4. Cheng H, Hoffer B, Stromberg I, Russell D, Olson L (1994. November) The effect of glial cell line-derived neurotrophic factor in fibrin glue on developing dopamine neurons. *24th Annual Meeting of Society for Neuroscience*. (Miami, USA)
5. Cheng H and Olson L (1995. May) A new surgical technique that improves proximo-distal regeneration of 5 HT fibers after complete transection of the rat spinal cord. *10th European Congress of Neurosurgery* (Berlin, Germany)
6. Cheng H, Almstrom S, Casserlov M, Olson L (1995. Nov) Structural and functional evidence of recovery following complete transection of the adult rat spinal cord. *9th Asian-Australian Congress of Neurological Surgery* (Taipei, Taiwan)
7. Cheng H, Almstrom S, Casserlov M, Olson L (1995. Nov) Structural and functional evidence of recovery following complete transection of the adult rat spinal cord. *25th Annual Meeting of Society for Neuroscience*. (San Diego, USA)
8. Cheng H, Olson L (1996. Oct) Spinal cord repair in adult paraplegic rats: five step method leading to regeneration and hind limb function. (Brescia, Italy)
9. Cheng H (1997. August) Plenary session: Spinal cord repair strategies. *4th International Neurotrauma Symposium* (Seoul, Korea)
10. Cheng H (1997. August) Workshop session: Using acidic FGF with nerve grafts for adult paraplegic rats. *4th International Neurotrauma Symposium* (Seoul, Korea)
11. Cheng H, Almstrom S, Gimenes-LLort L, Chang R, Ogren S, Huang W-C, Hoffer B, Olson L (1997 Oct.): Gait analysis of adult paraplegic rats after spinal cord repair. *27th Annual Meeting of Society for Neuroscience*. (New Orleans, U.S.A.)
12. Cheng H, Ding H, Cheng H-C, Huang W-C, Lee L-S (1997 Nov.): Endoscope-assisted Microsurgery for the repair of CSF leakage. *2nd Annual Meeting of Society for Neurosurgery, R.O.C.* (Taipei, Taiwan)
13. Cheng H, (62,6,141,1999): Updated Management of Brachial Plexus Injury. *1999 Congress and Scientific Meeting of the Chinese Medical Association, R.O.C.* (Taipei, Taiwan)
14. Cheng H (1999 Nov.) Plenary Session 4: Spinal Cord Repair Strategies-Problem and

- Prospects. *International Conference on Recent Advances in Neurotraumatology*. (Taipei, Taiwan)
15. Cheng H (2000 Nov.) Repair Strategies for Spinal Cord and Roots: from Basic Studies to Clinical Application. *7th Pacific Rim Biotechnology Conference and Bioexpo 2000* (Vancouver, Canada)
 16. Cheng H (2000 Nov. 30-Dec. 2) Recent Development of the Research for CNS Repair. *The Second Asia Pacific Symposium on Neural Regeneration*. (Xian, Mainland China)
 17. Cheng H (2001 May 18-19) Repair of Injured Roots in Rats. *Korean Neurotraumatology Society* (Pusan, Korea)
 18. Cheng H (2001 May 21) Spinal Cord Repair Strategies: from Basic Research to Clinical Trial. *2001 Catholic Neurotrauma Symposium*. (Seoul, Korea)
 19. Cheng H (2002 Nov. 2-7) Neuroprotection of Glial Cell Line Derived Neurotrophic Factor on Damaged Spinal Cords Following Contusive Injury. *32th Annual Meeting of Society for Neuroscience*. (Orlando, U.S.A.)
 20. Lin PH, Chuang TY, Tsai YA, Cheng H (2002 Nov. 21-24). Innovative Strategy for Root Avulsion of Obstetric Brachial Plexus Injury (OBPP): A Case Report. *American Academy of Physical Medicine & Rehabilitation*. (Orlando, U.S.A.)
 21. Cheng H (2003 Nov. 8-12) In Vitro Differentiation of Size-Sieved Stem Cells into Electrically Active Neural Cells. *33th Annual Meeting of Society for Neuroscience*. (New Orleans, U.S.A.)
 22. Cheng H (2004 Jun. 10-12) Prospective study of Nerve Repair in Patients with Chronic Spinal Cord Injury: A Report of Clinical Trial on 20 Patients. *Korean Neurotraumatology Society 2004 Annual Meeting*. (Seoul, Korea)
 23. Cheng Henrich, Liao Kwong-Kum, Liao Su-Fen, Chuang Tien-Yow, Shih Yang-Hsin (2004 Sep. 20-04) Spinal Cord Repair With Acidic Fibroblast Growth Factor as a Treatment for a Patient With Chronic Paraplegia. *II International Congress on Neuroregeneration* (Rio de Janeiro, Brazil)
 24. Cheng H (2004 Oct. 23-27) Neuroprotective effects of glial cell line-derived neurotrophic factor in fibrin glue against chronic focal cerebral ischemia in rats. *34th Annual Meeting of Society for Neuroscience*. (San Diego, U.S.A.)
 25. Wu JC, Huang W C, Lee LS, Shih YS, Huang CI, Cheng H (2004 Jul. 24-25) Surgical approach to benign neoplasm of cervical-medullary junction with instrumentation, six cases. Taiwan Neurosurgical Society. (Kaohsiung, Taiwan).
 26. Tsai MY, Cheng H, Huang WC, Chuang TY, Liao KK, Shih YH (2004 Jul. 24-25) Prospective study of nerve repair in patients with chronic cervical spinal cord injury. Taiwan Neurosurgical Society. (Kaohsiung, Taiwan).
 27. Chen C J, Lee MJ, Chang WC, Shiao JR, Lee LS, Cheng H (2004 Oct. 23-27) Down-regulated KSPG expression in the proximal stump and scar-cord interface after spinal repair. 34th Annual Meeting of Society for Neuroscience. (San Diego, U.S.A.).
 28. Fu YS, Yang LH, Chen YT, Lee LS, Cheng H (2004 Oct. 23-27) Continuous expression of aFGF around the transected adult rat spinal cord requires the synergistic effect of aFGF fibrin glue and peripheral nerve grafts. 34th Annual Meeting of Society for Neuroscience. (San Diego, U.S.A.).
 29. Kuo HS, Tsai MJ, Chang PT, You LH, Szeto Ka-Chun, Chang WC, Lee LS, Cheng H (2004 Oct. 23-27) AAV gene transfer of aFGF to neuronal cells in vitro and *in vivo*. 34th Annual Meeting of Society for Neuroscience. (San Diego, U.S.A.).
 30. Tsai MJ, Weng CF, Yang TH, Liou DY, Chung Y, Lee LS, Cheng H (2004 Oct. 23-27) Effect of BMP-7 overexpression via adenovirus-mediated transfer on spinal cord injury in culture and in vivo. 34th Annual Meeting of Society for Neuroscience. (San Diego, U.S.A.).
 31. Huang WC, Cheng PR, Hsu SH, Tseng HY, Lee LS, Cheng H (2004 Oct. 23-27) The application of chondroitinase ABC in the repair of complete spinal cord injury of adult rat.

- 34th Annual Meeting of Society for Neuroscience. (San Diego, U.S.A.)
32. Fu YS, Yang LH, Chen YT, Lee LS, Cheng H (2004 Oct. 23-27) Continuous expression of aFGF around the transected adult rat spinal cord requires the synergistic effects of aFGF fibrin glue and peripheral nerve graft. 34th Annual Meeting of Society for Neuroscience. (San Diego, U.S.A.)
 33. Huang MC, Cheng H, Yu LY, Shih YH, Lee LS (2004 Oct. 23-27) Repairing transected cervical roots in the chronic stage. 34th Annual Meeting of Society for Neuroscience. (San Diego, U.S.A.)
 34. Pei-Hsin Lin, Tien-Yow Chuang, Su-Fen Liao, Henrich Cheng (2005 Jun. 8-1) Cervical spinal cord injury by unusual foreign body penetration. 9th International Conference on Neural Transplantation and Repair. (Taipei, Taiwan.)
 35. Huang Wen-Cheng, Chuang Ten-Yow, Liao Kwong-Kum, Shih Yang-Hsin, Cheng Henrich (2005 Apr. 16-21) Prospective Study of Nerve Repair in Patients with Chronic Cervical Spinal Cord Injury. *2005 Annual Meeting of American Association of Neurological Surgeons* (New Orleans, Louisiana, U.S.A.)
 36. Henrich Cheng, Kwong-Kum Liao, Su-Fen Liao, Tien-Yow Chuang, and Yang-Hsin Shih (2005 June 8–11) Spinal Cord Repair With Acidic Fibroblast Growth Factor as a Treatment for a Patient with Chronic Paraplegia. *9th International Conference on Neural Transplantation and Repair*. (Taipei, Taiwan)
 37. Pei-Hsin Lin, Tien-Yow Chuang, Su-Fen Liao, Henrich Cheng (2005 June 8–11) Spinal Cord Repair With Acidic Fibroblast Growth Factor as a Treatment for a Patient with Chronic Paraplegia. *9th International Conference on Neural Transplantation and Repair*. (Taipei, Taiwan)
 38. Liu, KD, M.J Tsai, S.F. Fan, A.M.Y. Lin, S.C. Hung, H. Cheng (2005 June 8–11) Bone marrow stem cell (BMSC) transplantation restores functional deficits in rat model of Parkinson's Disease. *9th International Conference on Neural Transplantation and Repair* (Taipei, Taiwan) Abstract No: P2b-18.
 39. Kuo H.S., M.J. Tsai, P.T. Chang, L.H. You, K.C. Szeto, W.C. Chang, L.S. Lee and H. Cheng (2005 June 8–11) The combination of peripheral nerve grafts and acidic fibroblast growth factor enhances arginase I expression in rat transected spinal cord. *9th International Conference on Neural Transplantation and Repair* (Taipei, Taiwan) Abstract No: P3b-09.
 40. Chang P.T., M.J. Tsai, H.S.Kou, S.M. Liang, M.C. Huang and H. Cheng (2005 June 8–11) AAV gene transfer of aFGF to neuronal cells in vitro and in vivo. *9th International Conference on Neural Transplantation and Repair* (Taipei, Taiwan) Abstract No: P4a-07.
 41. Chang P.T., M.J. Tsai, H.S.Kou, S.M. Liang, M.C. Huang and H. Cheng (2005 June 8–11) Surgical Approach to Benign Neoplasm of Cervical-Medullary Junction with Instrumentation – Six Cases. *4th Meeting of the Asian Society for Neuro-Oncology* (Taipei, Taiwan)
 42. Cheng Henrich, Liao Kwong-Kum, Liao Su-Fen, Chuang Tien-Yow (2005 Sep. 1-3) Spinal Cord Repair with Acidic FGF as a Treatment for the Patient with Chronic Paraplegia and Quadriplegia. *1st congress of International Society of Reconstructive Neurosurgery and 4th Scientific Meeting of the WFNS Neurorehabilitation Committee: Neurosurgical Re-engineering of the Damaged Brain and Spinal Cord* (Seoul, Korea.)
 43. Huang MC, Cheng H, Chang Shao-En, Liu Yee-Chiang , Lo Ming-Jei, Yu Li-Yu, Shih Yang-Hsing Shih, Lee Liang-Shong (2005 Nov. 12-16) Repairing Transected Cervical Roots in the Chronic Stage. *35th Annual Meeting of Society for Neuroscience*. Washington D.C., U.S.A.)
 44. Pei-Teh Chang, Shu-Man Liang, May-Jywan Tsai, Huai-Sheng Kuo, Ming-Chu Tsai, Kin-Fu Chak, Ming-Chao Huang, Jia-Ping Chang, Yang-Shin Shih, Liang-Shong Lee, and Henrich Cheng (2005 Nov. 12-16) Characterization of Protein Profiles of the Injured Spinal Cord at Acute and Chronic Stages by a Proteomic Approach. *35th Annual Meeting of Society for Neuroscience*. Washington D.C., U.S.A.)
 45. Meng-Jen Lee, Ching-Jung Chen, Hsiao-Ching Wei, Wen-Chi Chang, Yang-Hsin Shih,

- Liang-Shong Lee, and Henrich Cheng (2005 Nov. 12-16) Wallerian Degeneration and Preservation of Endoneurium of the PNS Nerve Graft in a CNS Repair Model. *35th Annual Meeting of Society for Neuroscience*. Washington D.C., U.S.A.)
46. Wen-Cheng Huang, Tien-Yow Chuang, K.K. Liao, Y.H. Shih, Liang-Shong Lee, and Henrich Cheng (2005 Nov. 12-16) Prospective Study of Nerve Repair in Patients with Chronic Cervical Spinal Cord Injury. *35th Annual Meeting of Society for Neuroscience*. Washington D.C., U.S.A.)
47. Shiang-Suo Huang, Shen-Kou Tsai, Chun-Lien Chih, May-Jywan Tsai, Huai-Sheng Kuo, Kai-Hung Hung, Shih-Hui Huang, Ka-Chun Szeto, Shiao-Chi Lin, Wen-Cheng Huang, Yang-Hsin Shih, Liang-Shong Lee, and Henrich Cheng (2005 Nov. 12-16) Therapeutic Benefit of Grafted Fibrin Glue Containing Bone Marrow Stem Cell on Conscious Rats after Chronic Focal Cerebral Ischemic Injury. *35th Annual Meeting of Society for Neuroscience*. Washington D.C., U.S.A.)
48. Huang MC, Cheng H, Yu LY, Shih YH, Lee LS (2005 Nov. 12-16) Neuron Derived from Size-Sieved Stem Cells. *Scotland-Taiwan Hi-Tech Forum, Life Sciences Meeting*. (Edinburgh, England)
49. Cheng Henrich, Liao Kwong-Kum, Liao Su-Fen, Chuang Tien-Yow (2005 Dec. 17-20) Spinal Cord Repair with Acidic FGF as a Treatment for the Patient with Chronic Paraplegia and Quadriplegia. *First International Spinal Cord Injury Treatments & Trials Symposium* (Hong Kong, China.)
50. Liang SM, P.T. Chang, M.C. Tsai, M.J. Tsai, K.F. Chak, H.S. Kuo, M.C. Huang and H. Cheng. (2006 March 18-19) Characterization of protein profiles of the injured spinal cord at acute and chronic stages by a proteomic approach. *The 21st Joint Annual Conference of Biomedical Sciences* Abstract No. 142.
51. Tsai, M.J., C.W. Chiou, Y.M.A. Chen, C.H. Chen, D.Y. Liou and H. Cheng (2006 March 18-19) Distribution and anatomical localization of glycine N-methyltransferase in the rat brain. *The 21st Joint Annual Conference of Biomedical Sciences* Abstract No 1045
52. Hsueh Y.H., Tsai M.J., Y.M.A. Chen and H. Cheng (2006 March 18-19) Enhanced glycine N-methyltransferase expression by adenovirus-mediated transfer protects MPTP-induced neurotoxicity. *The 21st Joint Annual Conference of Biomedical Sciences* Abstract No 1094.
53. Tsai M.J., C.H. Chen, Y.M.A. Chen, D.Y. Liou, C.W. Chiou and H. Cheng (2006 March 18-19) Overexpression of glycine N-methyltransferase by adenovirus-mediated transfer in cultures neurons is neuroprotective. *The 21st Joint Annual Conference of Biomedical Sciences* abstract No 1080.
54. Ho P.J., M.J. Tsai, P.T. Chang, H. Cheng and Y.S. Fu (2006 March 18-19) Neuroprotection of microglia-conditioned medium in contusive spinal cord injury. *The 21st Joint Annual Conference of Biomedical Sciences* abstract No 1260.
55. Pan H.A., M.J. Tsai, D.Y. Liou, C.F. Weng and H. Cheng (2006 March 18-19) Neuroprotective effect of BMP7 in a rat sciatic nerve clamped injury model. *The 21st Joint Annual Conference of Biomedical Sciences* abstract No 1072.
56. Cheng Henrich, Wen-Cheng Huang, Chau-Ching Wu, Wen-Chun Kuo, Liang-Shong Lee (2006 Apr. 22-27) Therapeutic application of slow released acidic fibroblastic growth factor in the chronic thoracic-lumbar injured patients. *2006 American Association of Neurological Surgeons* (San Francisco, CA, USA)
57. Cheng Henrich, Kwong-Kum Liao, Su-Fen Liao, Tien-Yow Chuang, Yang-Hsin Shih (2006 May. 17-19) Spinal Cord Repair with Acidic Fibroblast Growth Factor as A Treatment for A Chronic Paraplegic Patient *Cervical Spine Research Society XXII Annual Meeting* (Berlin, Germany)
58. Henrich Cheng, Sanford P.C. Hsu, Yang-Hsin Shih, Ming-Chao Huang, Tien-Yow Chuang, Wen-Cheng Huang, Hsiu-Mei Wu, Pei-Hsin Lin, Liang-Shong Lee (2006 Oct. 14-18) Repair of Multiple Cervical Root Avulsion with Sural Nerve Graft *2006 Society for Neuroscience* (Atlanta, GA, USA)
59. Henrich Cheng, Shen-Kou Tsai, Shiang Suo Huang (2006 Nov. 4-5) Therapeutic Benefit of

Grafted Fibrin Glue Containing Bone Marrow Stem Cells on Conscious Rats after Chronic Focal Cerebral Ischemic Injury *2006 International Symposium on Stroke Research* (Taipei, Taiwan, R.O.C.)

60. Cheng Henrich, Jau-Ching Wu, Wen-Cheng Huang, Ming-Chao Huang (2007 Apr. 14-19) A Novel Strategy for Repairing Preganglionic Cervical Root Avulsion in Brachial Plexus Injury by Sural Nerve Grafting. *2007 American Association of Neurological Surgeons* (Washington, DC, USA)
61. Wen-Cheng Huang, Jau-Ching Wu, Cheng Henrich (2007 Apr. 14-19) Use of Lateral Mass Screw in High Cervical Instability. *2007 American Association of Neurological Surgeons* (Washington, DC, USA)
62. Cheng Henrich (2007 Jun. 10-14) Repair of Chronic Spinal Cord and Root Injuries and Growth Factor Cocktail. *4th World Congress of the International Society of Physical and Rehabilitation Medicine* (Seoul, Korea)

Manual:

Cheng H and Lee YS. Spinal Cord Repair Strategies in Spinal Cord Medicine: Principles and Practice. **Demos Medical Publishing, New York**; 2002; Chapter 59, P. 801-816.